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ABSTRACT

Swimming is recognized as America's most popular active sport. It is one of the best physical activities for people of all ages and for people who are physically handicapped. Vigorous water exercises can increase a person's flexibility, strength, and cardio-vascular endurance. Exercises requiring flexibility are performed more easily in water because of the lessening of the gravitational pull; thus, individuals, especially the elderly, with painful joints or weak muscles will find it more comfortable to move in the water. This booklet describes a program of physical conditioning through water exercises. The exercises can be performed by the able-bodied, the handicapped, or older adults. Suggested activity drills include; pool-side standing, gutter-holding, bobbing, treading water, and extension ("sculling" related). Various workouts based upon physical condition of the participant are prescribed. (EA)

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AQUA DYNAMICS

WATER EXERCISES ARE THE NEW WAY TO STAY IN SHAPE

SP026184

Produced by the President's Council on Physical Fitness and Sports in cooperation with the National Spa and Pool Institute

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INTRODUCTION TO AQUA DYNAMICS BOOK

The National Spa and Pool Institute is proud to support the President's Council on Physical Fitness and Sports by funding the printing of *Aqua Dynamics.*

This is just one example of a "private sector initiative." Through our current cooperation with the Council, this booklet is made available free to the American people. We hope the Council's mission to encourage health and fitness programs for longer and happier lives has taken another step forward.

To reinforce the *Aqua Dynamics* program, NSPI has also produced an audio cassette of the instructions contained in the booklet. The cassette, made available on a cost basis, provides verbal instructions for exercises in the program and can be used easily with a tape recorder at pool side. An order blank is enclosed with this booklet.

NSPI, as the major swimming pool industry trade association, is committed to informing more Americans about the health and fitness benefits inherent to water recreation.

And, NSPI members throughout the country displaying the NSPI logo are dedicated to helping Americans fulfill their backyard dreams, so opportunities to participate in the *Aqua Dynamics* program are available to all. For more information write: National Spa and Pool Institute, 2000 K Street, N.W., Washington, DC 20006.

NATIONAL SPA & POOL INSTITUTE

AQUA DYNAMICS

PHYSICAL CONDITIONING THROUGH WATER EXERCISES

Swimming—A Priority Physical Fitness Activity

Swimming is recognized as America's most popular active sport. It is an activity that may be used for recreation on one day; physical conditioning on the next; and survival on another. It is one of the best physical activities for people of all ages and for many persons who are handicapped. Vigorous water activities can make a major contribution to the flexibility, strength, and circulatory endurance of individuals. With the body submerged in water, blood circulation automatically increases to some extent; pressure of water on the body also helps promote deeper ventilation of the lungs; and with well-planned activity, both circulation and ventilation increase still more.

Increased flexibility work is performed more easily in water because of the lessening of gravitational pull. A person immersed to the neck in water experiences an apparent loss of 90% of his weight. This means that the feet and legs of a woman weighing 130 lbs. immersed in water only has to support a weight of 13 lbs. Thus, individuals and especially older people with painful joints or weak leg muscles will usually find it possible and comfortable to move in the water. It is much easier to do leg straddle or stride stretches in water than on the floor. Too, many individuals could do leg "bobbing" or jogging in the water who could never do so on land.

Opportunities to Swim

As of January 1, 1980, there were 1,927,000 swimming pools constructed in the ground in the United States.[1] Of these, 1,530,400 were residential pools; 207,720 were in hotels, motels, or apartments; 57,275 in private clubs; 51,315 in public recreation agencies; 31,170 in schools, colleges and universities, and 48,450 miscellaneous, including camps. Since 1965, an average of 88,000 in ground pools have been built per year. In addition it is estimated that there are over 2 million pools installed above the ground.

Most residential pools are no larger than 36 ft. long by 17 ft. wide, with approximately 600 sq. ft. of water surface, ranging from 3 ft. to 8½ ft. in depth. In a swimming pool of this size, a workout would have to be adjusted considerably from that usually practiced in the typical school, college or athletic club pool. Otherwise, swimming in the backyard pool becomes largely: 1) diving in; 2) gliding across; and 3) climbing out. For the typical person, it would involve only inactive bathing. Swimming pools, regardless of size, have a high potential as exercise facilities. This potential can be realized as individuals learn how to exercise in limited water areas.

Aqua Dynamics—For Whom

The activities in this aquatic program are designed for the individual in sound health. A yearly medical examination is advisable for every adult. Such an examination should be taken before beginning a conditioning program.

How to Work

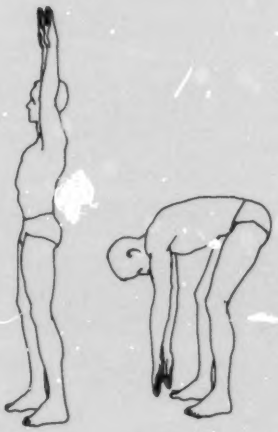
Exercise programs should be adapted to each person's tolerance level—the level at which he can perform comfortably and without undue distress. In order for workouts to be comfortable and continuous, and to achieve maximum potential, a combination system of training should be employed, using both "change of pace" and "interval training." Change of pace consists of the shifting from one activity to another involving a different set of muscles or type of stress and the changing of the intensity of the work. Interval training is interspersing repeated periods of physical work with recovery periods during which activity of a reduced intensity is performed.

[1] Hoffman Publication, Ft. Lauderdale, Florida

Warming Up

During a workout the body should be warmed up by light conditioning and stretching exercises before heavier activities are attempted. Deck exercises including flexibility and strength activities with heavy breathing are appropriate. Various strokes may be simulated. Participants should begin with light rhythmical work at a slow pace. A tempo should be gradually accelerated, alternating slow with faster work, until one nears perspiration.

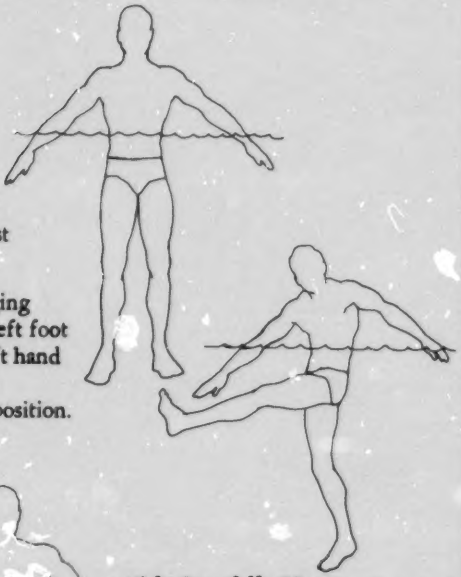
Most swimming activities cause the back to be in hyperextended position, thus specific back stretching exercises should be completed both at the beginning and end of the workout. For maximum benefit, the individual should stand with legs apart, extending the hands high over head and reaching as high as is possible. After approximately 5–10 seconds in the arms-over-head reaching position, one should bend the trunk forward and down, flexing the knees, and the bending and stretching position should be held for approximately 20–30 seconds, then the high reaching followed by the bending and stretching action should be repeated.



Through proper warm-up the body's deep muscle temperature will be raised and the ligaments and connecting tissues stretched, thereby preparing the body for vigorous work. This will help avoid injury and discomfort.

The following is Aqua Dynamics, a regimen of high-potential physical activities which can be used in a small pool or in a limited area of a crowded institutional pool.

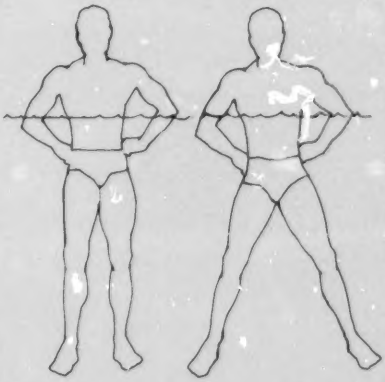
STANDING WATER DRILLS



Alternate Toe Touch

Standing, in waist-to-chest deep water, swimmer:

(1) Raises left leg bringing right hand toward left foot looking back and left hand extended rearward.
(2) Recover to starting position.
Repeat.
Reverse.



Side Straddle Hop

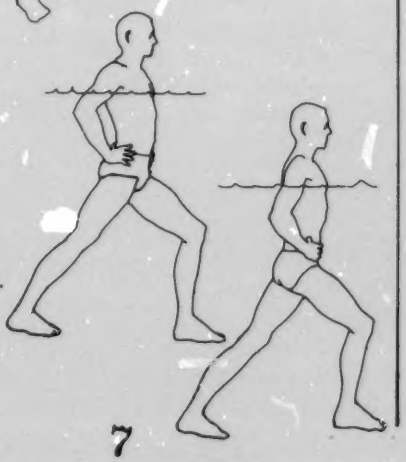
Standing in waist-to-chest deep water with hands on hips, swimmer:

(1) Jumps sideward to position with feet approximately two feet apart.
(2) Recovers.

Stride Hop

Standing in waist-to-chest deep water with hands on hips, swimmer:

(1) Jumps, with left leg forward and right leg back.
(2) Jumps, changing to right leg forward and left leg back.
Repeat.



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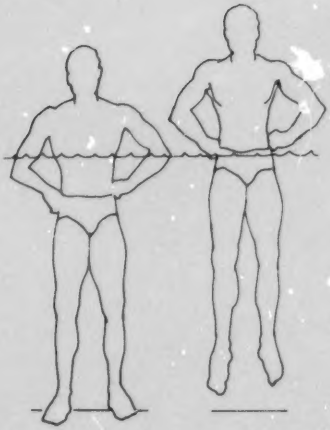
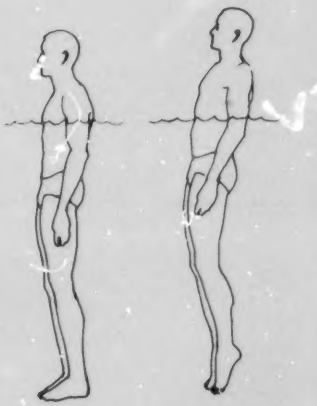
Toe Bounce

Standing in waist-to-chest deep water with hands on hips, swimmer:

(1) Jumps high with feet together through a bouncing movement of the feet.
Repeat.





Raise on Toes

Standing in chest-deep water, swimmer:

(1) Raises on toes.
(2) Lowers to starting position.
Repeat.
Accelerate.

Side Bender

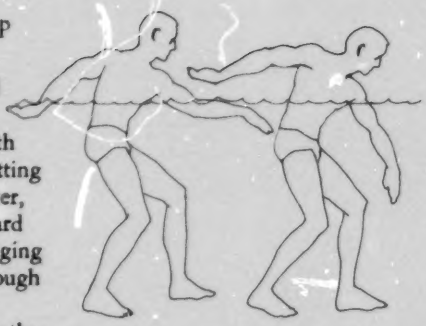
Standing in waist-deep water with left arm at side and right arm over head, swimmer:

(1) Stretches, slowly bending to the left.
(2) Recovers to the starting position.
Repeat.
Reverse to right arm at side and left arm overhead.

Standing Crawl

Standing in waist-to-chest deep water, swimmer:

(1) Simulates the overhand crawl stroke by:
   (a) Reaching out with the left hand, getting a grip on the water, pressing downward and pulling, bringing the left hand through to the thigh.
   (b) Reaching out with the right hand, etc.
   Repeat.



Walking Twists

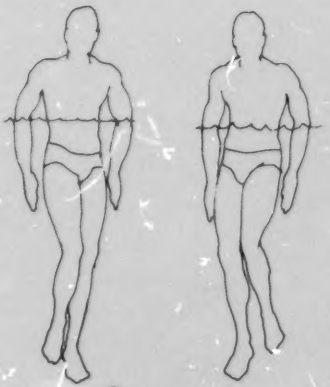
With fingers laced behind neck, swimmer:

(1) Walks forward bringing up alternate legs twisting body to touch knee with opposite elbow.
   Repeat.

Bouncing

Standing in chest-deep water, swimmer:

(1) Bounces on left foot at the same time pushing down vigorously with both hands causing the upper body to rise, and
(2) Bounces similarly on right foot pushing down with both hands, etc.
   Repeat.



Bounding in Place With Alternate Arm Stretch Forward

Standing in waist-deep water, swimmer:

(1) Bounds in place with high knee action; right arm outstretched far forward when left knee is high, and the left arm and hand stretched rearward.

(2) When right knee is high, outstretches the left arm and hand forward, with the right arm and hand stretched rearward.

Special Note: When the position of the arm and hand are reversed, pull down and through with hand simulating the propulsion of the crawl stroke.

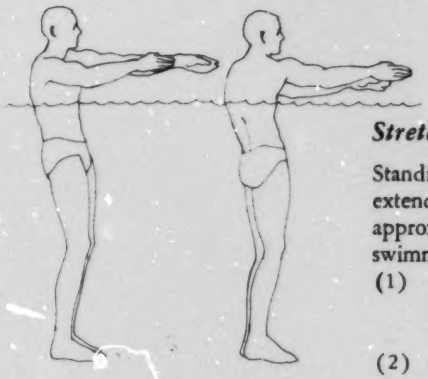
Repeat.

Jogging in Place

Standing with arms bent in running position, swimmer:

(1) Jogs in place.

POOL-SIDE STANDING DRILLS



Stretch and Touch

Standing, facing wall with arms extended and fingertips approximately 12" from wall, swimmer:

(1) With shoulders under water, twists left and tries to touch wall with both hands.

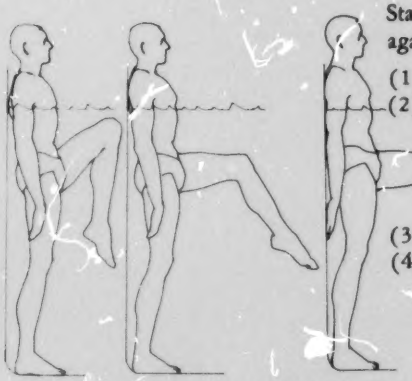
(2) Twists right and tries to touch wall with both hands. Repeat.

Flat Back

Standing at side of pool in waist-to-chest deep water, swimmer:

(1) Presses back against wall, holding for six counts.

(2) Relaxes to starting position. Repeat.



Leg Out

Standing at side of pool with back against wall, swimmer:

(1) Raises left knee to chest.

(2) Extends left leg straight out.

(3) Stretches leg.

(4) Drops leg to starting position.

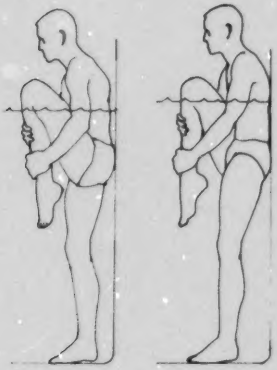
Repeat.

Reverse to right leg

Pull and Stretch

Standing at side of pool with back against wall, swimmer:

(1) Raises left leg and clasps calf with both arms pulling leg vigorously to the chest.
(2) Recovers to starting position.
(3) Raises right leg and clasps calf with both arms pulling leg vigorously to the chest.
(4) Recovers to the starting position.



GUTTER-HOLDING DRILLS

Pool-side Knees Up

Supine, holding on to pool gutter with hands and legs extended, swimmer:

(1) Brings knees to chin.
(2) Recovers to the starting position.

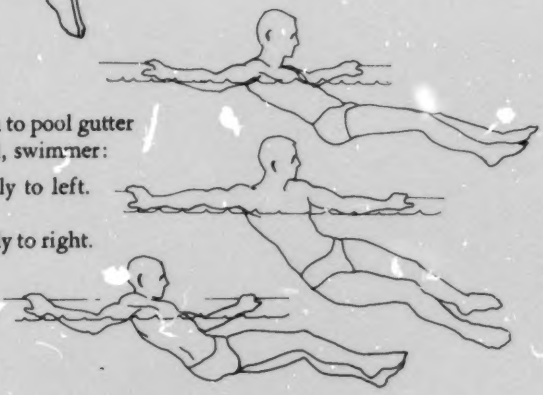
Repeat.

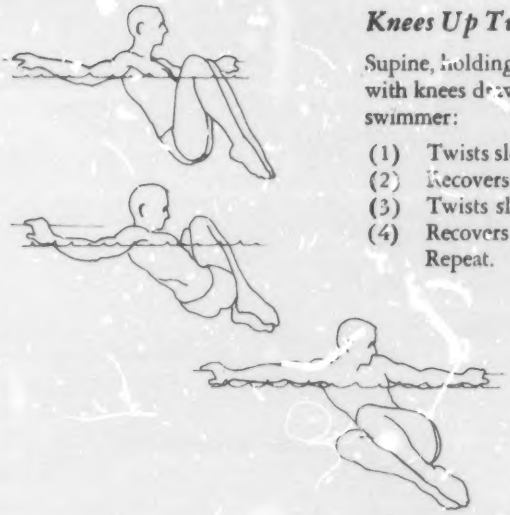
Twisting Legs

Supine, holding on to pool gutter with legs extended, swimmer:

(1) Twists slowly to left.
(2) Recovers.
(3) Twists slowly to right.
(4) Recovers.

Repeat.





Knees Up Twisting

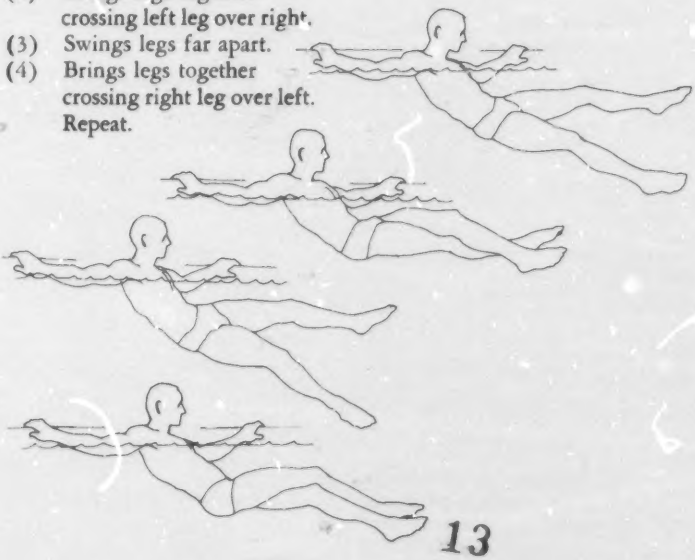
Supine, holding on to pool gutter with knees drawn up to chest, swimmer:

(1) Twists slowly to left.
(2) Recovers.
(3) Twists slowly to right.
(4) Recovers.
Repeat.

Leg Crosses

Supine, holding on to pool gutter with legs extended, swimmer:

(1) Swings legs far apart.
(2) Brings legs together crossing left leg over right.
(3) Swings legs far apart.
(4) Brings legs together crossing right leg over left.
Repeat.



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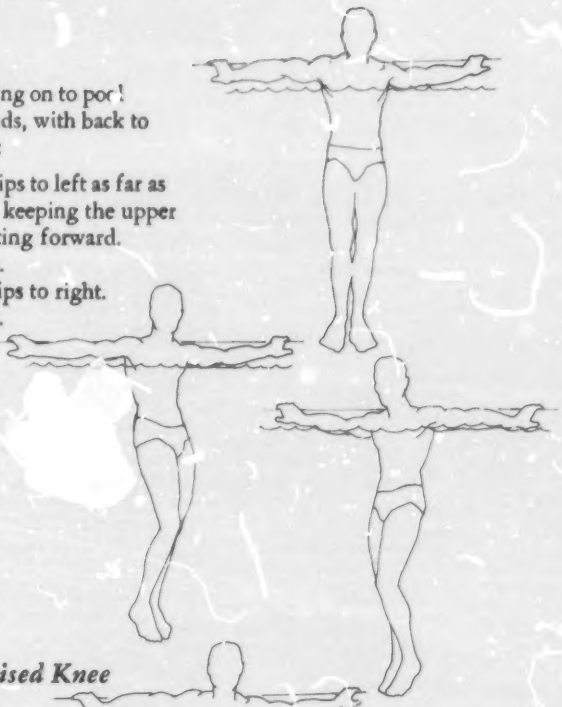
Twist Hips

Standing, holding on to pool gutter with hands, with back to wall, swimmer:

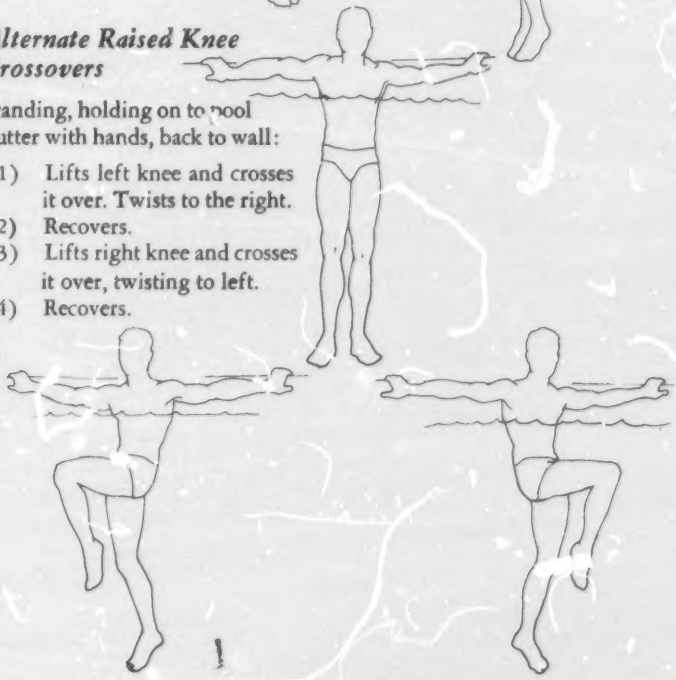
(1) Twists hips to left as far as possible, keeping the upper trunk facing forward.
(2) Recovers.
(3) Twists hips to right.
(4) Recovers.



Alternate Raised Knee Crossovers

Standing, holding on to pool gutter with hands, back to wall:

(1) Lifts left knee and crosses it over. Twists to the right.
(2) Recovers.
(3) Lifts right knee and crosses it over, twisting to left.
(4) Recovers.



Legs Together on Back

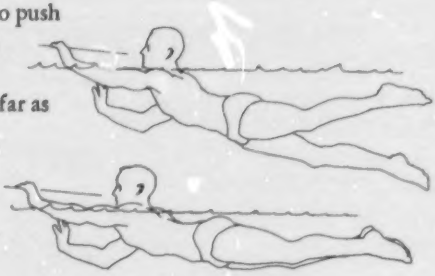
Supine, holding on to pool gutter with hands. Legs together and extended with feet about 6" under the water:

(1) Spreads legs apart as far as as possible.
(2) Pulls feet and legs vigorously together. Repeat.

Legs Together on Front

Prone, holding on to pool gutter with one hand flat on wall to push legs out, with feet together, swimmer:

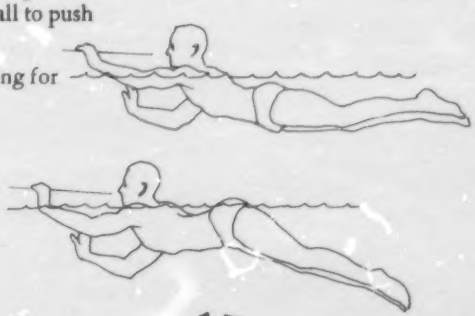
(1) Spreads legs apart as far as possible.
(2) Pulls feet and legs vigorously together. Repeat.



Raising Hips

Prone, holding on to pool gutter with one hand flat on wall to push legs out, swimmer:

(1) Raises hips, holding for four counts.
(2) Relaxes. Repeat.



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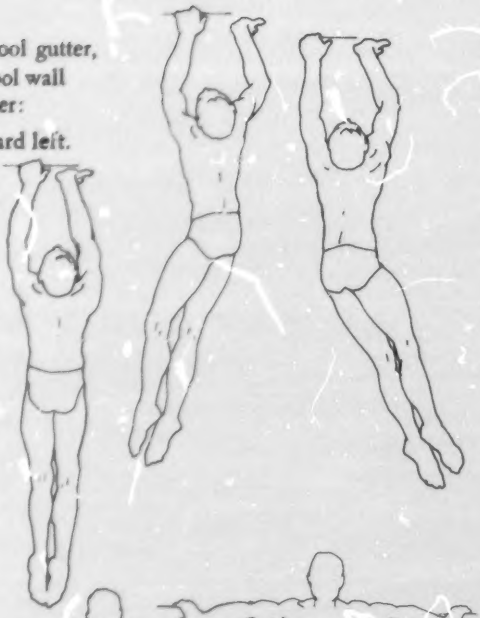
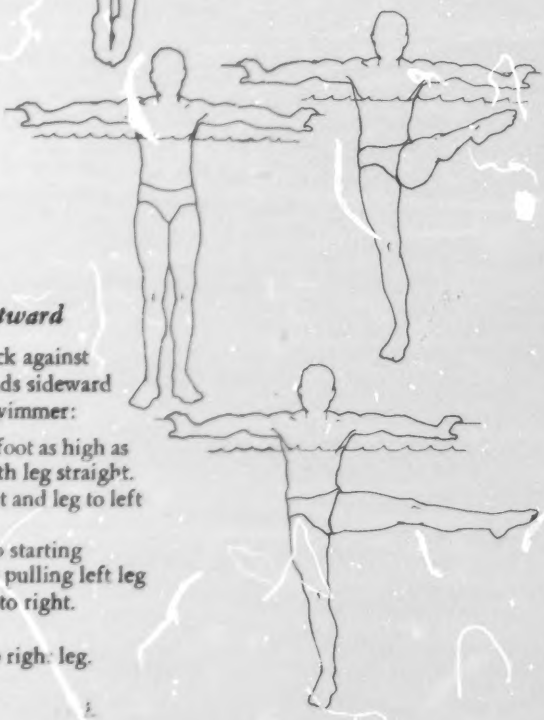
Circle Legs

Prone, holding on to pool gutter, with one hand flat on pool wall to push legs out, swimmer:

(1) Circles legs outward left.
(2) Repeat.
(3) Reverses to right.
Repeat.





Leg Swing Outward

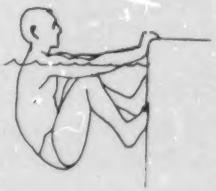
Standing with back against poolside, and hands sideward holding gutter, swimmer:

(1) Raises left foot as high as possible with leg straight.
(2) Swings foot and leg to left side.
(3) Recovers to starting position by pulling left leg vigorously to right.
Repeat.
Reverses to right leg.
Repeat.

Circle Ankles

Prone, holding on to pool gutter, swimmer:

(1) Circles ankles left.
Repeat.
Reverses to right.



Climbing

Hands in pool gutter facing pool side and feet flat against side and approximately 16" apart, swimmer:

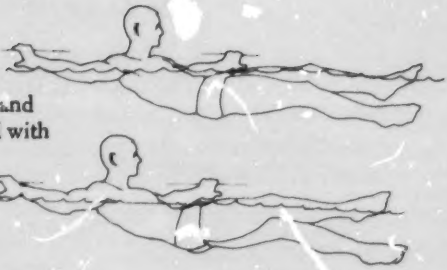
(1) Walks up side by approximately six short steps.
(2) Walks down side to starting position.
Repeat.

Front Flutter Kicking

Lying in a prone position and holding on to side of pool with hand(s), swimmer:

(1) Kicks flutter style in which toes are pointed back, ankles are flexible, knee joint is loose but straight and the whole leg acts as a whip.

Back Flutter Kicking



Lying in a supine position and holding on to sides of pool with hand(s), swimmer:

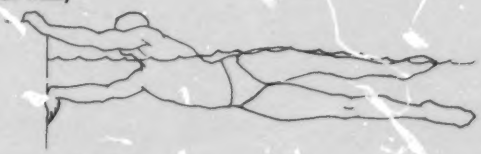
(1) Flutter kicks.

Left Side Flutter Kicking

Lying on a side position holding on to side of pool with right hand, with left hand braced on pool wall, swimmer:

(1) Flutter kicks.

Right Side Flutter Kicking



Lying on right side position, holding on to side of pool with left hand braced on pool wall, swimmer:

(1) Flutter kicks.

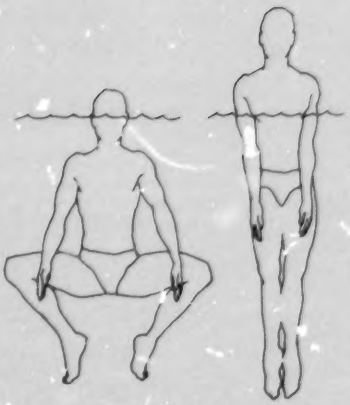
BOBBING

An excellent conditioning activity in water is "bobbing." In "bobbing," the head and shoulders are pushed out of the water much like a cork held under water "bobs" when released. "Bobbing" is a feet-first surface dive. Some experts say that if one had only five minutes for exercise each day, it would be best to spend that time in one of four ways: 1) running, 2) trampolining, 3) rope skipping, or 4) high bobbing. During "bobbing" activities, the demands for breathing are great. "Bobbing" forces the breathing. Breathing itself is an exercise and the quick inhaling and forced exhaling requires greater effort. Maximum exertion usually demands maximum respiration. This is facilitated by regular practice of deep respirations during "bobbing". One realizes the stimulus of forced, heavy breathing after advanced "bobbing" for five minutes (approximately 100–125 times). Approximately 20 percent of Aqua Dynamics is devoted to "bobbing."

Elementary Bobbing

Standing in shallow water, swimmer:

(1) Takes a breath.
(2) Submerges in a tuck position with feet on the pool bottom in shallow water. Exhales during (2) and (3).
(3) Shoves up off the bottom and regains a standing position.
(4) Inhales with head out of water.
(5) Repeat (2), (3), (4), etc.



Alternate Leg Rearward Bobbing

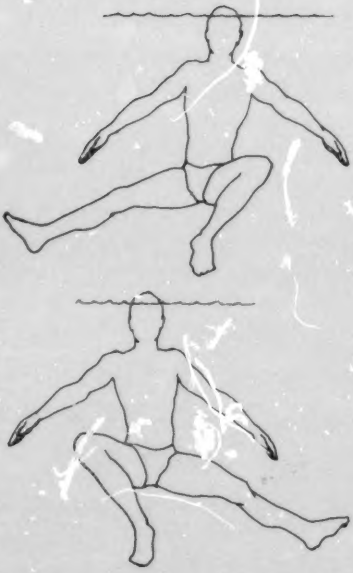
Standing in shallow water, swimmer:

(1) Takes a breath.
(2) Submerges in shallow water with left leg in a squatting position with left foot on the pool bottom and right leg extended rearward. Exhales during (2) and (3).
(3) Shoves up off the bottom reversing the position of the legs, inhaling when the head is out of water.
(4) Submerges with right leg in a squatting position with right foot on pool bottom and left leg extended rearward. Exhales during the action.
(5) Repeat 1, 2, 3, and 4.

Alternate Leg Sideward Bobbing

Standing in waist-to-chest deep water, swimmer:

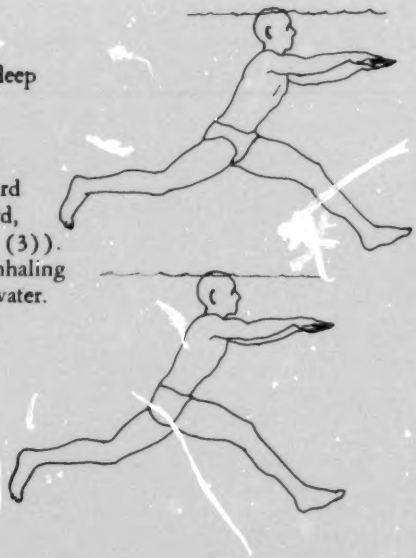
(1) Takes a breath.
(2) Submerges with left leg in a full squatting position, left foot on pool bottom and right leg extended sideward, (exhales during (2) and (3)).
(3) Shoves up off bottom reversing the position of the legs and inhaling when the head is out of water.
(4) Submerges with the right leg in a full squatting position with the right foot on pool bottom and the left leg extended sideward (exhales during the action). Repeat.



Legs Astride Bobbing

Standing in waist-to-chest deep water, swimmer:

(1) Takes a breath.
(2) Submerges with legs astride, left leg forward and right leg rearward, (exhales on (2) and (3)).
(3) Shoves off bottom, inhaling when head is out of water.
(4) Submerges with legs astride.
Repeat.



Advanced Bobbing

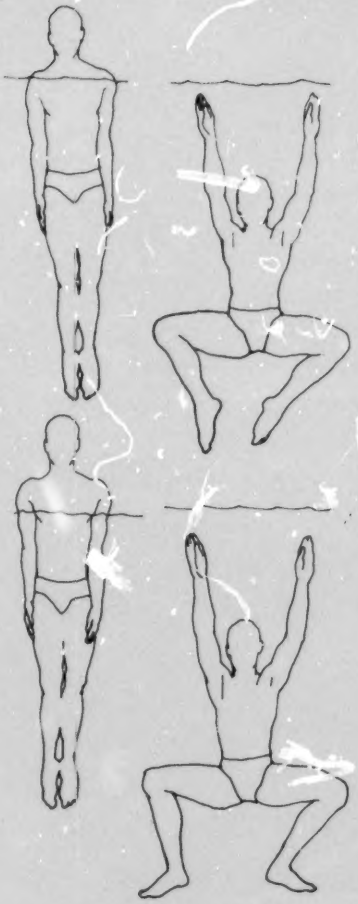
Treading in deep water, swimmer:

(1) Assumes a vertical position with hands extended outward from the sides, just under the surface of the water, with palms turned downward. Legs are drawn in a position of readiness for a frog or scissors kick.

(2) Executes kick as hands are pulled sharply to thighs and legs. (As a result of this action, the head and shoulders rise out of the water and a deep breath is taken at the highest point reached).

(3) As the body sinks, the arms are outstretched overhead and swimmer exhales.

Repeats (1), (2), and (3).



Left/Right Leg Bobbing

Standing or treading in deep water, swimmer:

(1) Takes a breath.

(2) Submerges in a tuck with right leg drawn up with left foot on pool bottom.

(3) Pushes upward off left leg thrust, exhaling during (1) and (2).

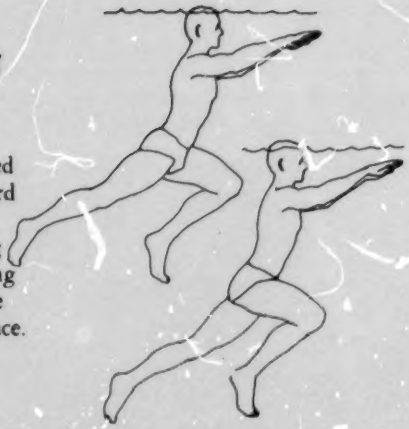
(4) Inhales with head out of water.

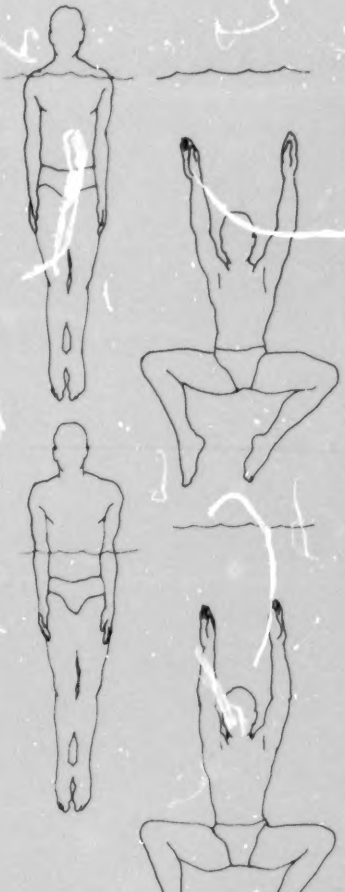
(5) Repeat
Reverse to right leg.

Progressive Alternate Leg Forward Bobbing

Standing, swimmer:

(1) Performs action described in Alternate Leg Rearward Bobbing (page 9), alternating legs, bobbing progressively, and moving forward the length of the pool or a specified distance.





High Bobbing

In water approximately one to three feet over the swimmer's head, swimmer:

(1) Takes a vertical position, hands extended outward from the sides with palms turned downward. Legs are drawn in position for frog kick.

(2) Simultaneously pulls hands sharply to thighs with legs executing frog kick.

(3) Inhales at peak of height.

(4) Drops with thrust of arms downward with palms turned upward until feet reach bottom of the pool and tucks to a squat position. Exhales throughout this action.

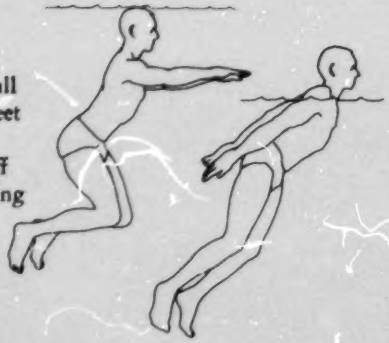
(5) Jumps upward with power leg thrust at the same time pulling arms in in a breast stroke position downward, causing the head and shoulders to rise high out of water. Exhales during (4) and (5).

(6) Inhales and repeats cycles (4) and (5), etc.

Progressive "Bunny Hop" Bobbing

Standing, swimmer:

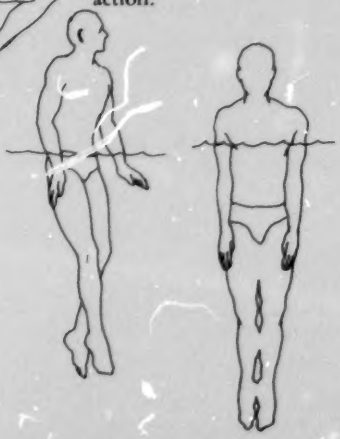
(1) Takes a breath.
(2) Submerges in a tuck or full squatting position with feet on the pool bottom.
(3) Pushes up and forward off bottom of the pool, exhaling during (2) and (3).
(4) Inhales with head out of water.
(5) Repeat, pushing forward the length of the pool or a specified distance.



Power Bobbing

Power bobbing is similar to "high bobbing" except that at the top of the upward thrust the hands scull vigorously as the legs flutter kick. In "power bobbing" the swimmer will literally blast out of the water exposing all of the body to the hips.

Bobbing is a well-rounded workout involving leg power, arm and shoulder work, heavy forced breathing, and rhythmical vigorous action.



TREADING WATER

Elementary Treading

In water deep enough that toes will not touch bottom, in a perpendicular position, swimmer:

(1) Sculls or fins as he kicks bicycle, scissors, or frog style.

Advanced Treading

In water over head in a perpendicular position, swimmer:

(1) Kicks bicycle, scissors, or frog style with hands held shoulder high and body in a perpendicular position.

One Hand High Treading

In water over head in a perpendicular position, swimmer:

(1) Kicks bicycle, scissors, or frog style holding one arm straight up and other hand held shoulder high. Reverse arms.

Two Hands High Treading

In water over head in a perpendicular position, swimmer:

(1) Kicks bicycle, scissors, or frog style holding both arms straight up out of water.

Look-Out Treading

In deep water in a perpendicular position, swimmer:

(1) Kicks vigorously at the same time thrashing the water by sculling, thereby raising the shoulders and chest high out of the water.

EXTENSIONS

Breathing

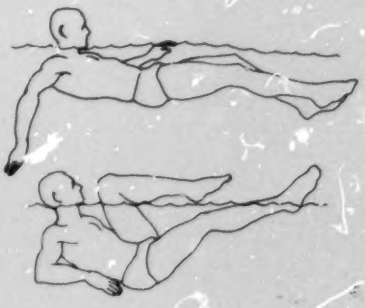
Controlled breathing is essential for the activities which follow. The swimmer should inhale through the mouth and exhale through the nose. One should be exhaling through the nose at any time the head is under water.

Sculling

"Extension" activities are largely dependent upon sculling ability. Sculling is done by arm and hand action. The use of the hands in sculling is the same basic maneuver regardless of the position of the body or the direction one wishes to go. Sculling can provide lifting power or combined lifting and propulsion power. Action usually begins by pushing down on palms, with arms sideward. Hands are flat, fingers together, and thumbs close to forefingers. With thumbs up, rotate wrists, bringing palms forward, then turn palms downward and backward. Downward pressure should be held constant on both the

sideward and forward movements. Lifting power is provided as the hand is drawn to the front and side and parallel to the water surface.

Special Note: On all "extension" activities which follow, *swimmer should stay in the same place in the pool.*



Left Knee Up, Back

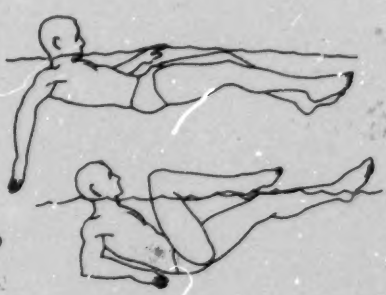
Assuming a supine position, swimmer:

(1) Sculls, drawing left knee up to chest with right leg extended and toes on the right foot out of water.
(2) Sculls, straightening the left leg thus returning to the starting position.
Repeat.

Right Knee Up, Back

Assuming a supine position, swimmer:

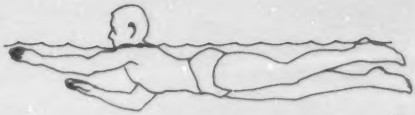
(1) Sculls, drawing right leg up to chest with left leg extended and toes on the left foot out of water.
(2) Sculls, straightening the right leg thus returning to the starting position.
Repeat.



Knees Up, Back

Starting from a back-lying position, swimmer:

(1) Sculls, drawing knees up to chest.
(2) Sculls, shoving legs forward returning to a back-lying position.
Repeat.



Knees Up, Front

Starting from a front-lying position, swimmer:

(1) Sculls, drawing knees up to chest.

(2) Sculls, shoving legs backward returning to the front-lying position.
Repeat.

Knees Up, Left Side

Starting from a left side stroke position, swimmer:

(1) Sculls, drawing knees up to chest.

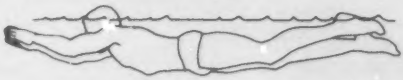
(2) Sculls, shoving legs to the right side causing the body to be in a left side stroke position.
Repeat.

Knees Up, Right Side

Starting from a right side stroke position, swimmer:

(1) Sculls, drawing knees up to chest.

(2) Sculls, shoving legs to left side causing the body to be in a right side stroke position.
Repeat.



Front and Back

Starting from a vertical position, swimmer:

(1) Sculls, drawing knees up to chest, shoving legs forward coming up to a back-lying position.

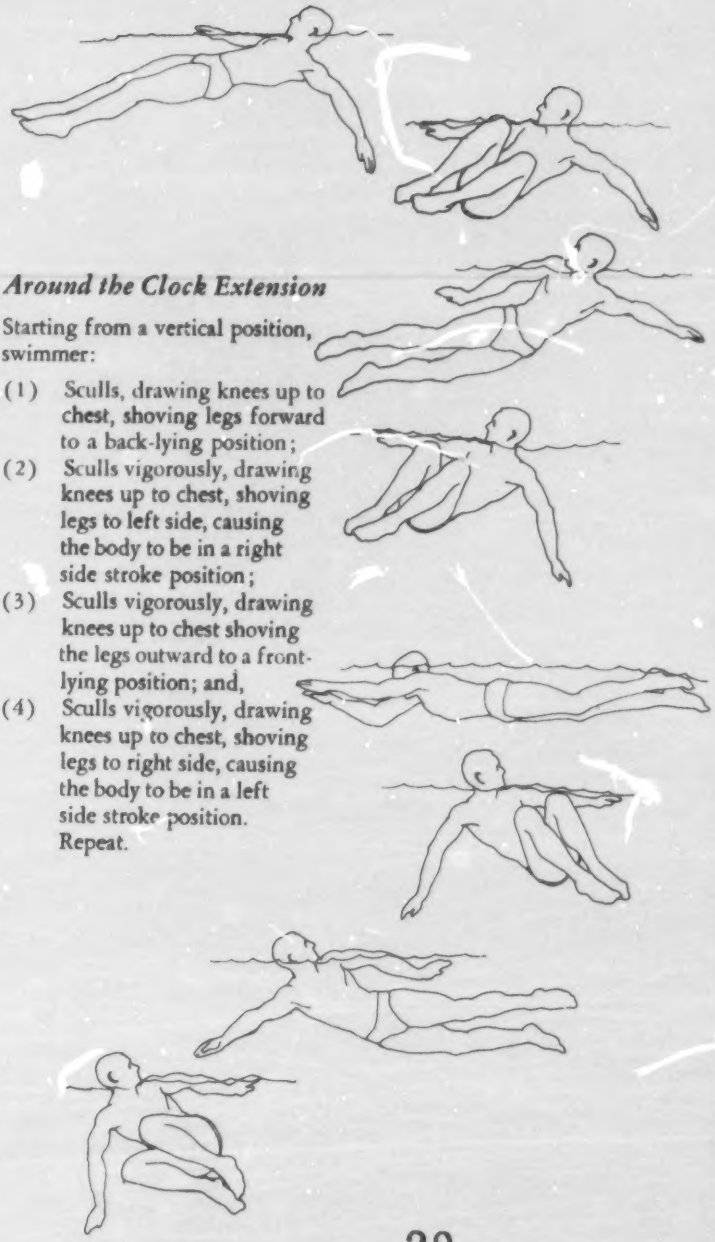
(2) Sculls drawing knees up to chest, shoving legs backward coming to a front lying position.
Repeat.

Reverse Sides Extension

Starting from a vertical position, swimmer:

(1) Sculls, drawing knees up to chest, shoving legs to left side causing body to be in a right side stroke position.

(2) Sculls vigorously, drawing knees up to chest and reversing position, shoving legs to the right side, shifting body to a left side stroke position.
Repeat.



Around the Clock Extension

Starting from a vertical position, swimmer:

(1) Sculls, drawing knees up to chest, shoving legs forward to a back-lying position;

(2) Sculls vigorously, drawing knees up to chest, shoving legs to left side, causing the body to be in a right side stroke position;

(3) Sculls vigorously, drawing knees up to chest shoving the legs outward to a front-lying position; and,

(4) Sculls vigorously, drawing knees up to chest, shoving legs to right side, causing the body to be in a left side stroke position. Repeat.

OTHER WATER EXERCISES

Pedaling in Water

Starting from a back-lying position in water, swimmer:

(1) Simulates a pedaling motion with knees raised alternately to the chest, using reverse sculling to stay in same place in pool.

Rub-A-Dub-Dub

Starting from a back-lying position in water, swimmer brings knees to chest with knees and toes together, and:

(1) Spins in a circle by using an opposite sculling motion of hands.

(2) After one full turn, reverses action. Repeat.

*Left Leg Raiser**

Starting, from a back-lying position, swimmer:

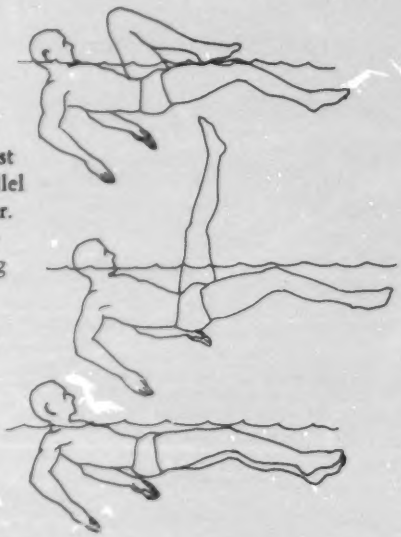
(1) Sculls continuously, bringing left knee to chest until knee is nearly parallel to the surface of the water.

(2) Sculls, straightening the left leg so that the left leg is perpendicular to the water surface.

(3) Returns to (1), the left knee to chest position.

(4) Returns to back-lying position.

Repeat.



* Very difficult for most men

*Right Leg Raiser**

Starting from a back-lying position, swimmer:

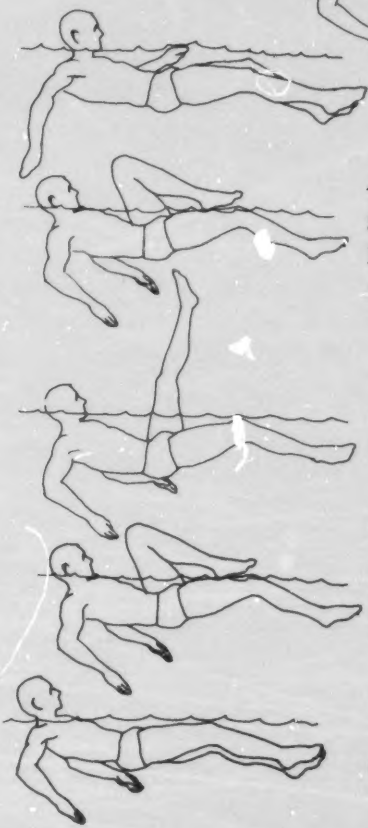
(1) Sculls continuously, bringing right knee to chest until thigh is nearly parallel to the surface of the water.

(2) Sculls, straighening the right leg so that the right leg is perpendicular to the water surface.

(3) Returns to (1) the right knee to chest position.

(4) Returns to back-lying position.

Repeat.



*Alternate Leg Raiser**

Starting from a back-lying position, swimmer:

(1) Sculls continuously, bringing left knee to chest until thigh is nearly perpendicular to the surface of the water.

(2) Sculls, straightening the left leg so that the left leg is perpendicular to the water surface.

(3) Returns to (1) the left knee to chest position.

(4) Returns to back-lying position.

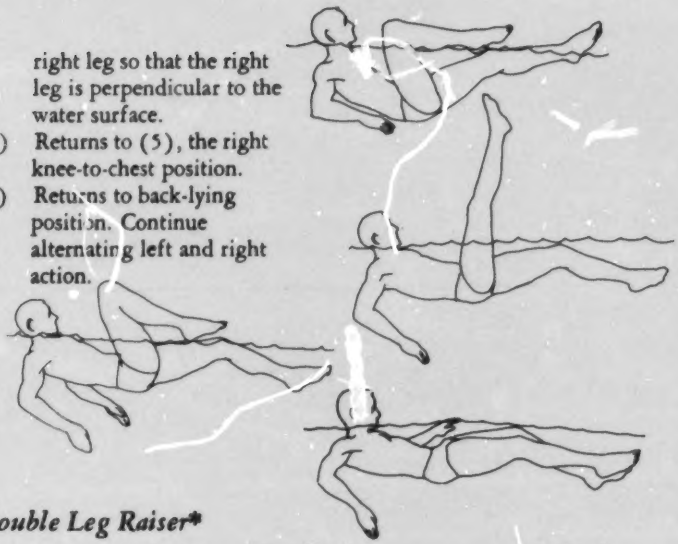
(5) Sculls continuously, bringing right knee to chest until thigh is nearly perpendicular to the surface of the water.

(6) Sculls, straightening the

right leg so that the right leg is perpendicular to the water surface.

(7) Returns to (5), the right knee-to-chest position.

(8) Returns to back-lying position. Continue alternating left and right action.



*Double Leg Raiser**

Starting from a back-lying position, swimmer:

(1) Sculls continuously, bringing knees to the chest until thighs are perpendicular to the surface of the water.

(2) Straightens both legs together extending them skyward so they are nearly perpendicular to the surface of the water.

(3) Returns to the back-lying position.
Repeat.

*High Sculling**

Starting from a standing position, swimmer brings knees to chest with heels close to hips and

(1) Sculls, figure 8 motion, vigorously using arms only, raising the upper body as high as possible out of water.

* Very difficult for most men

Alternate Sculling and Treading

In water overhead in a perpendicular position, swimmer:

(1) Treads water with hands held shoulder high and body in a perpendicular position for a specified time.

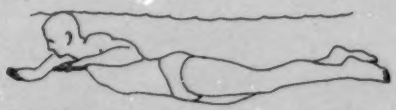
(2) Shifts to sculling action of the arm and hands with the knees pulled up so that the heels of the feet are under the hips. Sculling without the use of the legs or the feet is done for a specified time.

(3) Follows the action outlined in (1) above.

(4) Follows the action outlined in (2) above.

Under and Up

Swim 4 breast strokes under water, come up and breathe. Repeat.



Sculling V Sit

From a back-lying position, lower hips and raise feet out of water with toes pointed so that the body is in a V position and scull in the direction the swimmer is facing for a specified distance or time.

LAP SWIMMING

Despite the small distance covered after shove-off the side and glide in the residential pool, lap swimming is still an excellent activity. If the pool is clear, take off and enjoy swimming hard until you begin to feel winded. Ease off by loafing with a lazy breast or side stroke until you feel recovered, then go again. Another way to begin the interval training program in the swimming pool is to swim one length of the pool, get out, walk back, and repeat a number of times. For an individual in poor physical condition, a regimen of 5 to 10 lengths, walking back after each length may be necessary for several weeks or months. As endurance improves the number of lengths should be increased progressively.

WORKOUTS

In order to illustrate how the aforementioned water exercises could be combined in different workouts, the following examples are provided:

Very Low Gear 15 minutes

		Page
Side Straddle Hop	15 seconds	4
Standing Crawl	30 seconds	6
Walking Twists	15 seconds	6
Toe Bounce	15 seconds	5
Flat Back	15 seconds	8
Pull and Stretch	30 seconds	9
Leg Out	30 seconds	8
Front Flutter	30 seconds	14
Back Flutter	30 seconds	15
Alternate Leg Rearward Bobbing	1 minute	16
Leg Swing Outward	30 seconds	13
Bounding in Place with Arm Stretch	30 seconds	7
Elementary Treading	30 seconds	21
Lap Swimming—Interval	9 minutes	31

Low Gear 20 minutes

Stride Hop	15 seconds	4
Standing Crawl	30 seconds	6
Front Flutter	1 minute	14
Back Flutter	1 minute	15
Front Flutter	1 minute	14

		Page
Pull and Stretch	30 seconds	9
Leg Swing Outward	1 minute	13
Advanced Bobbing	1 minute	18
Left Knee Up, Back	30 seconds	23
Right Knee Up, Back	30 seconds	23
Alternate Leg Rearward Bobbing	30 seconds	16
Knees Up, Back	30 seconds	23
Alternate Leg Sideward Bobbing	30 seconds	17
Bounding in Place with Arm Stretch	45 seconds	7
Knees Up, Front	30 seconds	24
Advanced Bobbing	1 minute	18
Knees Up, Left	30 seconds	24
Knees Up, Right	30 seconds	24
Advanced Bobbing	1 minute	18
Reverse Sides Extension	30 seconds	25
Lap Swimming—Interval	6½ minutes	31

Middle Gear 30 minutes

Front Flutter	2 minutes	14
Back Flutter	2 minutes	15
Front Flutter	1 minute	14
Alternate Leg Rearward Bobbing	1 minute	16
Knees Up, Front	1 minute	24
Knees Up, Back	1 minute	23
Alternate Leg Sideward Bobbing	1 minute	17
Front and Back Extensions	1 minute	25
High Bobbing	3 minutes	19
Reverse Sides Extension	1 minute	25
Progressive Bobbing	2 minutes	19
Rub-A-Dub-Dub	2 minutes	27
Left Leg Raiser	15 seconds	27
Right Leg Raiser	15 seconds	28
Alternate Leg Raisers	30 seconds	28
High Bobbing	1 minute	19
Lap Swimming—Interval	10 minutes	31

High Gear 60 minutes

Front Flutter	3 minutes	14
Back Flutter	3 minutes	15
Advanced Bobbing	3 minutes	18
Left Knee Up, Back	1 minute	23
Right Knee Up, Back	1 minute	23
Knees Up, Back	1 minute	23
High Bobbing	3 minutes	19

		Page
Knees Up, Front	1 minute	24
Alternate Leg Rearward Bobbing	2 minutes	16
Front and Back Extensions	2 minutes	25
Alternate Leg Sideward Bobbing	2 minutes	17
Reverse Sides Extensions	2 minutes	25
Bounding in Place with Arm Stretch	3 minutes	7
Progressive Alternate Leg Forward Bobbing	3 minutes	19
Rub-A-Dub-Dub	3 minutes	27
Left Leg Raiser	30 seconds	27
Right Leg Raiser	30 seconds	28
Power Bobbing	1 minute	20
Alternate Leg Raiser	30 seconds	28
Bounding in Place with Arm Stretch	3 minutes	7
Toe Bounce	1½ minutes	5
Leg Swing Outward	2 minutes	13
Lap Swimming—Interval	Remainder	31

PCPFS Film

Swimming is unique in that age is no hindrance and individuals of varying exercise tolerance levels can utilize this activity to develop organic vigor and to improve flexibility, strength and the blood circulation.

Contrary to an old myth, swimming is compatible with training for other sports. It does not detract from the strength gained through other conditioning activities in the training regimen.

Obviously, individuals in poor condition must work slowly and progressively. It has taken many years for most adults to get out of shape. One should be patient and realize that rebuilding the heart, lungs, and body may take a long period of time. A commitment to regularity and gradual build-up will pay off. There may be speed limits but no age limits for either sex. Daily workouts are recommended, but gains can be made with 30–40 minutes of water work 3–5 times per week. Train don't strain!

The film, *Aqua Dynamics,* showing the aforementioned activities, is available free for long-term loan to National and/or State agencies/associations from:

THE PRESIDENT'S COUNCIL ON
PHYSICAL FITNESS AND SPORTS
Washington DC 20001